

REMARKS

The Examiner is thanked for the thorough examination of this application. The Office Action, however, tentatively rejected all claims 1-28. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

Rejections under 35 U.S.C 102

The Office Action rejected claims 1-9, 13, 15-23, 26, and 27 under 35 U.S.C 102 (b) as allegedly anticipated by ARTHUR (U.S. patent 5,354,611). The Office Action also rejected claims 1-4 and 15-18 under 35 U.S.C 102 (b) as allegedly anticipated by HARMER (U.S. patent 5,824,622). Applicant respectfully requests reconsideration and withdrawal of these rejections.

With respect to ARTHUR, ARTHUR discloses a composite material. The composite material comprises:

(a) a polytetrafluoroethylene fluoropolymer matrix; and
(b) from about 20 volume percent to about 70 volume percent **first coated inorganic particles** distributed throughout the matrix, said first coated inorganic particles comprising:

(b-1) *hollow* inorganic microspheres; and
(b-2) a hydrophobic coating on the hollow inorganic microspheres.

ARTHUR further discloses that the composite material **comprises**:

(a) a polytetrafluoroethylene fluoropolymer matrix;

(b) from about 20 volume percent to about 70 volume percent **first coated inorganic particles** distributed throughout the matrix, said first coated inorganic particles comprising:

(b-1) *hollow* inorganic microspheres; and

(b-2) a hydrophobic coating on the hollow inorganic microspheres and

(c) a **second coated inorganic particles** distributed throughout the matrix, provided that the combined amount of the first and second coated inorganic particles does not exceed 70 volume percent. (**See ARTHUR column 2, line 34 to column 3, line 26 and Claims 1 and 9.**)

Significantly, ARTHUR discloses the **first** coated inorganic particles comprising hollow inorganic microspheres, such as hollow silica microspheres or borosilicate microspheres, but fails to disclose the first coated inorganic particles being **porous** silica having a **pore size of 0.1 to 50nm** as recited in independent claims 1 and 15. ARTHUR discloses that the **second** coated inorganic particles may comprise porous inorganic particles having an average pore diameter such as 40 angstroms. *However, the second coated inorganic particles are not hydrophobic modified silica.*

That is, if the Office Action regards the first coated inorganic particles as the mesoporous silica, then ARTHUR does not teach "mesoporous silica having **a pore size of 0.1 to 50nm**" as recited in claims 1 and 15. On the other hand, if the Office Action regards the second coated inorganic particles as the mesoporous silica, then ARTHUR does not teach "**hydrophobic modified** mesoporous silica" as recited in claims 1 and 15. Thus, under either interpretation of ARTHUR, certain expressly-recited features of claim 1 are missing.

With respect to HARMER, HARMER discloses a porous microcomposite of perfluorinated ion-exchange polymer and metal oxide. The porous microcomposite comprises perfluorinated ion-exchange polymer with pendant sulfonic acid groups, carboxylic acid groups, or sulfonic acid and carboxylic acid groups entrapped within and highly dispersed throughout a network of metal oxide, a network of silica, or a network of metal oxide and silica, wherein the weight percentage of perfluorinated ion-exchange polymer in the micro-composite is from about 0.1 to about 90 percent, wherein the size of a first set of pores in the microcomposite is about 0.5 nm to about 75 nm, and wherein the microcomposite optionally further comprises a second set of pores having a size in the range of about 75 nm to about 1000 nm. (see e.g., claim 1 of HARMER). However, HARMER fails to disclose the **hydrophobic modified** mesoporous silica as expressly recited in claims 1 and 15 of the present application. Furthermore, neither ARTHUR nor HARMER discloses a composite material having dissipation factor less than 0.4.

Referring now to the claims, **independent claim 1** recites:

1. A mesoporous silica/fluorinated polymer composite material, comprising:
10 to 70 parts by weight of **hydrophobic modified mesoporous silica having a pore size of 0.1 to 50nm**, and
30 to 90 parts by weight of fluorinated polymer.

(Emphasis Added)

Independent claim 15 recites:

15. A mesoporous silica/fluorinated polymer composite material, comprising **hydrophobic modified mesoporous silica having a pore size of 0.1 to 50nm** and fluorinated polymer in proportion such that the mesoporous silica/fluorinated polymer composite material has dielectric constant, **dissipation factor**, and coefficient of thermal expansion **less than 4, 0.04**, and 60ppm/°C, respectively.

(Emphasis Added). Independent claims 1 and 15 patently define over the cited art for at least the reasons that the cited art fails to disclose the features emphasized above.

MPEP 2131 states that “a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference” (*quoting Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628,631 (Fed Cir. 1987)).

As set forth above, neither ARTHUR nor HARMER teach or reasonably suggest at least the features/limitations that have been emphasized above in independent claims 1 and 15. Accordingly, the rejection of claims 1 and 15 are deficient and claims 1 and 15 are in condition for allowance. As dependent claims 2-14 incorporate all the limitations of claim 1 and dependent claims 16-28 incorporate all the limitations of claim 15, Applicant respectfully asserts that these claims also are in condition for allowance.

Rejections under 35 U.S.C 103

The Office Action rejected claims 10-13, 24, and 25 under 35 U.S.C (a) as allegedly unpatentable over either ARTHUR or HARMER in view of FUJIWARA (US 2004/0213996). The Office Action also rejected claims 14 and 28 under 35 U.S.C (a) as allegedly unpatentable over either ARTHUR or HARMER in view of ANDO (JP 011339988 Abstract). Applicant respectfully traverses the rejections.

According to MPEP 2143, to establish a *prima facie* case of obviousness, the prior reference (or references when combined) must teach or suggest all the claim limitations. Applicant respectfully asserts that the cited references, either individually or in combination, are legally deficient for the purpose of rendering obvious the features/limitations recited in

independent claims 1 and 15. Specifically, Applicant respectfully asserts that ARTHUR, HARMER, FUJIWARA and/or ANDO do not teach or reasonably suggest at least the features/limitations emphasized above in claims 1 and 15. Therefore, Applicant respectfully asserts that claims 1 and 15 are not obvious. As dependent claims 2-14 incorporate all the limitations of claim 1, dependent claims 16-28 incorporate all the limitations of claim 15, Applicant respectfully asserts that the rejection of these claims also is improper, and respectfully requests that the rejection be removed.

As a separate and independent basis for the patentability of the claims rejected under 35 U.S.C. § 103, Applicant submits that the alleged combinations of ARTHUR/HAMMER and FUJIWARA or ARTHUR/HAMMER and ANDO does not render obvious certain claims. In this regard, the Office Action made these combinations on the solely expressed basis that “since the mesoporous hexagonal silica still contains the required pore size and therefore the properties of the composite are expected to be the same” (re claims 10-13, 24, and 25) or because “the shape of the silica would not alter the pore size of the mesoporous silica and therefore it would be expected to yield a composite having the same properties” (claims 14 and 28) (Office Action, p. 6). These rationales are both incomplete and improper in view of the established standards for rejections under 35 U.S.C. § 103.

In this regard, the MPEP section 2141 states:

Office policy has consistently been to follow *Graham v. John Deere Co.* in the consideration and determination of obviousness under 35 U.S.C. 103. As quoted above, the four factual inquires enunciated therein as a background for determining obviousness are briefly as follows:

- (A) Determining of the scope and contents of the prior art;
- (B) Ascertaining the differences between the prior art and the claims in issue;
- (C) Resolving the level of ordinary skill in the pertinent art; and

(D) Evaluating evidence of secondary considerations.

...
BASIC CONSIDERATIONS WHICH APPLY TO OBVIOUSNESS REJECTIONS

When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to:

- (A) The claimed invention must be considered as a whole;
- (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and
- (D) Reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

Simply stated, the Office Action has failed to at least (1) ascertain the differences between and prior art and the claims in issue; and (2) resolve the level of ordinary skill in the art. Furthermore, the alleged rationale for combining the various references embodies clear and improper hindsight rationale. For at least this additional reason, Applicant submits that the rejections of claims 10-14, 24, 25, and 28 are improper and should be withdrawn.

CONCLUSION

For at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the pending claims are in condition for allowance.

If the Examiner believes a teleconference will expedite the examination of this application, the Examiner is invited to contact the undersigned attorney at 770-933-9500.

No additional fee is believed to be due in connection with this submission. If, however, any additional fee is deemed to be payable, you are hereby authorized to charge any such fee to deposit account 20-0778.

Respectfully submitted ,

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